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*Global Precipitation Measurement (GPM) mission*

**Precipitation Processing System (PPS)**

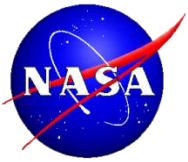
**GPM Mission Gridded Text Products**

**Provide Surface Precipitation Retrievals**

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Huffman, W. Olson, J. Kwiatkowski**

NASA/GSFC Code 610.2

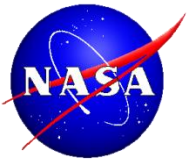
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# Topics



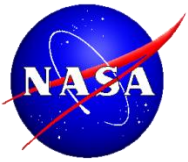
- **Standard GPM mission products available**
- **Obtaining GPM mission products**
- **Background of the gridded text products**
- **Content of the gridded text products**
- **Available tools for the gridded text products**
- **Plans for future gridded text products**



# Obtaining All GPM Mission products



- **Must be a registered PPS user**
  - Register at URL: <http://registration.pps.eosdis.nasa.gov>
  - Must provide information
    - Valid, reachable email
    - Affiliation
    - GPM product interest
  - Will receive an email to the registered address and must then validate
- **Registered email address is username AND password for both the query and search interface**
  - STORM: <http://storm.pps.eosdis.nasa.gov>
  - ftp location: `arthurhou.pps.eosdis.nasa.gov`
- **All data included gridded text products are online and available in either of the ways**
- **Ftp access is really a special anonymous ftp implementation.**
  - For Linux and MAC it is possible to make a `.netrc` entry
  - Such an entry will facilitate access via scripts without requiring manual entry of username and password.



# GPM Production Swath Products



Toolkit ID	Granule	Description
1AGMI	Gorbit	GMI unpacked packet data
1BGMI	Gorbit	GMI Brightness Temperatures
1CGMI	Gorbit	GPM Common Calibrated Brightness Temperature
GMIBASE	Gorbit	GMI Antenna Temperatures
1BKa	Gorbit	Ka Power
1BKu	Gorbit	Ku Power
2AGPROFGMI	Gorbit	Radiometer Precipitation/profiling
2BCMB	Gorbit	L-2 Combined DPR and GMI
2ADPR	Gorbit	DPR precipitation
2AKa	Gorbit	Ka precipitation
2AKu	Gorbit	Ku precipitation

Gorbit- Southernmost part of orbit to southernmost



# GPM Mission Gridded Products



Toolkit ID	Granule	Description
3AGMIGPROF	Daily & Monthly	GMI GPROF precip .25 deg x .25 deg
3APartnerGPROF	Daily & Monthly	Partner Constellation GPROF precip .25 deg x .25 deg
3AKu	Daily & Monthly	Ka Power
3AKa	Daily & Monthly	Ku Power
3ADPR	Daily & Monthly	Radiometer Precipitation/profiling
3ACombined	Daily & Monthly	L-2 Combined DPR and GMI
3IMERG-Half Hour	Half-hour	.1 deg x .1 deg merged radiometer/IR Precip
3IMERG-Month	Monthly	.1 deg x .1 deg merged radiometer/IR Precip



# GPM NRT Products



Toolkit ID	Description
1CGMI	GPM Common Calibrated Brightness Temperature (5min)
2AGPROFGMI	Radiometer Precipitation/profiling (5min)
2AKu	Ku 3-D profile of precipitation (30min)
2AKa	Ka 3-D profile of precipitation (30min)
2ADPR	Dual-Frequency 3-D profile of precipitation (30min)
2BCMB	Level-2 DPR and GMI Combined (30min)
3IMERGH	I-MERG 30-minute (.1 x .1 grid) (early and Late)

- 1C for each contributing radiometer (size depending upon instrument)
- GPROF for each contributing radiometer (size depending upon instrument)



# Background of Gridded Text Product



- **First provided during the Tropical Rainfall Measuring Mission (TRMM) (3G series of products) to provide just surface precipitation retrievals in an easy to use format**
- **Was determined that space delimited fields of ASCII text terminated by a newline character was the easiest to use**
- **In TRMM the 3G products had an internal compression scheme that made lines have different number of fields on a line.**
  - NOT done in GPM gridded text product
  - In GPM gridded text product every line always has same number of fields
- **In TRMM text products so become among the most popular products for users**
- **Basic objectives**
  - Keep format simple
  - Provide just basic information about the surface precipitation
  - Maintain hourly information (helps with diurnal studies)
  - Package as a daily file to minimize number of download necessary
  - Use information from the swath products directly



# Content of GPM Gridded Text Products



- **Details of product including calculations used in poster 2015-1387**
- **Five lines of metadata describing the product**
- **Hourly grids at .25 deg x .25 deg**
- **Each data line contains**
  - Row number of global grid, column number of global grid
  - Hour (starting at 0), Minute (starting at 0)
  - Four surface precipitation retrievals in grid box
    - GMI GPROF
    - KU
    - DPR matched (Ku/Ka) swath (dual-frequency retrieval)
    - Combined matched (GMI/Ku/Ka) swath
  - Each retrieval type (of the four used) has:
    - Total pixels
    - Number of precipitating pixels
    - Mean precipitation rate
    - Convective fraction
    - Liquid fraction
    - Retrieval quality





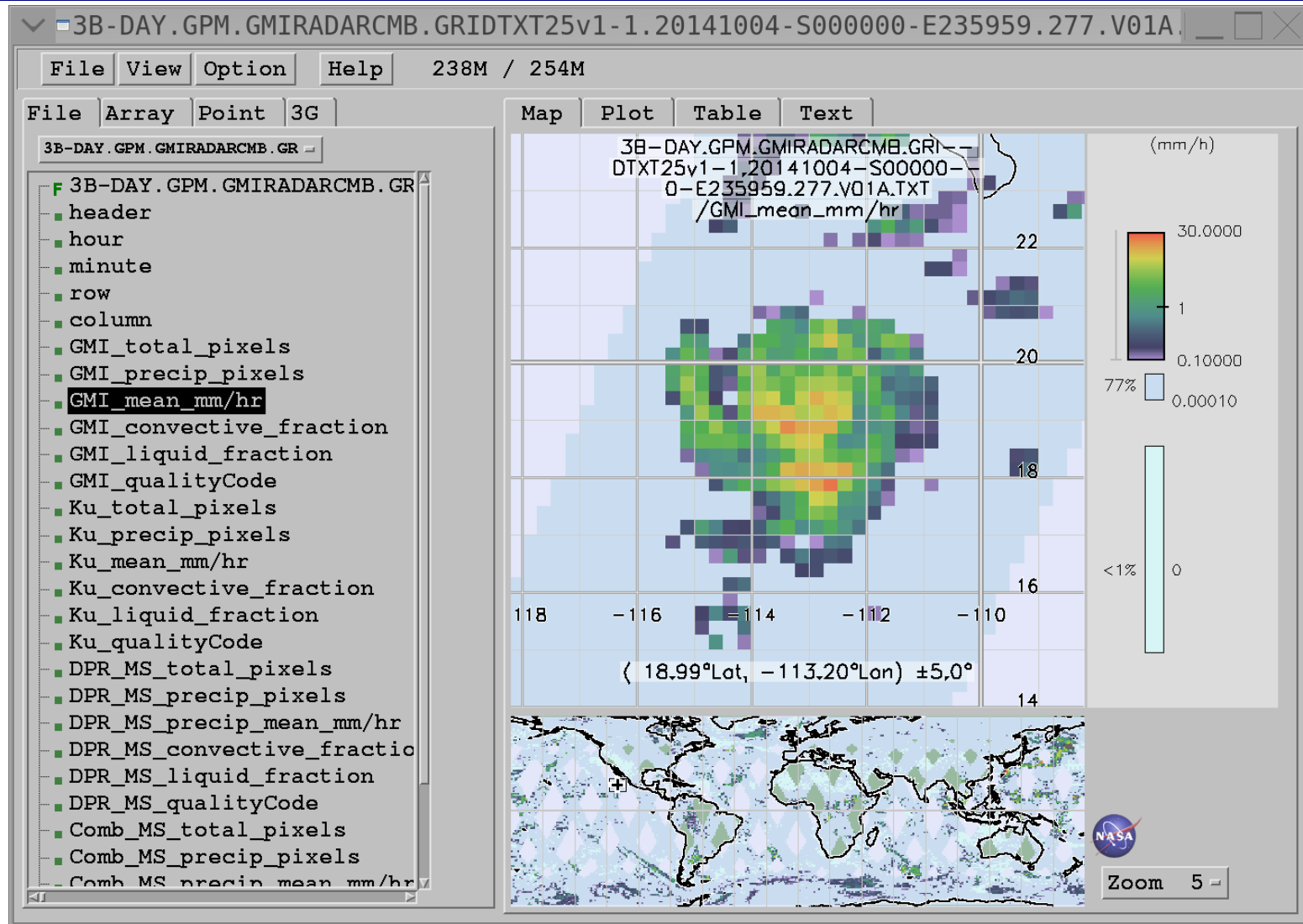
# Available tools for the Gridded Text Products



- **Tool High-resolution Observation Review (THOR)**
  - Data viewing and analysis tool
  - Allows looking through the gridded text product and finding the value of variables
  - See image (next slide)
  - Download URL: [pps.gsfc.nasa.gov](https://pps.gsfc.nasa.gov)
- **Combining tool**
  - C programs
  - Allows combining all the daily gridded text products into a single file
  - Can retain the hourly grids or collapse all hours into a single hour grid (thereby providing a total aggregation)
  - If interested email: [erich.f.stocker@nasa.gov](mailto:erich.f.stocker@nasa.gov)
  - Within 6 months will be available in python



# Example of THOR with Gridded Text Product





# Plans for Future Gridded Text Products



- **Current plans call for two additional type of gridded text products to be produced in time for the first major GPM reprocessing in September 2015**
- **GPROF retrievals from partner constellation microwave conical scanning radiometers**
  - SSMIS (F16-F19)
  - AMSR2
  - This expected to be available by the beginning of August
- **GPROF retrievals from partner constellation cross track radiometers**
  - MHS (NOAA18, NOAA19, MetopA, MetopB)
  - Saphir
  - ATMS
  - Not expected to be ready until September